

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings of claims in the application:

Claim 1 (Currently Amended): A polyalkene amine formulation, comprising:
at least one polyalkene amine in a solvent,

wherein the formulation has at least one of the following low temperature properties:

- a) a cloud point less than or equal to -28°C ☐ determined according to DIN ISO 3015 or DIN EN 23015 ☐;
- b) a pour point less than or equal to -27°C ☐ determined according to DIN ISO 3016 ☐; and/or
- c) no crystalline precipitates after storage at a temperature in the region of about -35°C ;

wherein the solvent is selected from mixtures of:

S1) at least one n- or iso- $\text{C}_{10}\text{-C}_{14}$ paraffin,

S2) at least one $\text{C}_{10}\text{-C}_{14}$ naphthene; and

wherein S1 and S2 are present in a mixing ratio of from 10:90 to 90:10.

Claim 2 (Previously Presented): The formulation according to claim 1, wherein the pour point ranges from about -27 to -55°C and/or the cloud point ranges from about -28 to -51°C .

Claim 3 (Currently Amended): The formulation according to claim 1, wherein the solvent has

a density ☐ at 15°C ☐ according to ASTM D 4052 ☐ and EN ISO 12185-1996 ☐ in the range from about 650 to 900 kg/m^3 , and/or

a viscosity ~~[[()]]~~ at 20°C~~[[,]]~~ according to ASTM D 445~~[[()]]~~ in the range from about 1.0 to 5.0 mm²/s.

Claims 4-6 (Canceled).

Claim 7 (Currently Amended): The formulation according to claim 1, wherein the polyalkene moiety of the polyalkene amine is ~~[[the]]~~ a polymerization product of identical or different, straight-chain or branched C₂-C₆ olefin monomers.

Claim 8 (Currently Amended): The formulation according to claim 7, wherein the polyalkene moiety of the polyalkene amine has a number-average molecular weight Mn of from about 200 to 10 000.

Claim 9 (Currently Amended): The formulation according to claim 8, wherein the ~~polyalkenes~~ polyalkene moiety of the polyalkene amine is derived from iso-butene or an isobutenic monomer mixture.

Claim 10 (Currently Amended): The formulation according to claim 9, wherein the polyalkene moiety of the polyalkene amine is a polyisobutene (~~PIB~~).

Claim 11 (Currently Amended): The formulation according to claim 1, wherein the polyalkene amine is a polyisobutene amine (~~PIBA~~) which is derived from a polyisobutene having at least one of the following properties:

a) a fraction of vinylidene double bonds of at least 70 mol%, based on polyisobutene;

- b) a polyisobutene polymer structure ~~composed of~~ comprises at least 85% by weight of isobutene units; and
- c) a polydispersity in the range from 1.05 to 7.

Claim 12 (Currently Amended): The formulation according to claim 1, wherein the polyalkene amine is ~~[[the]]~~ a reaction product of a polyalkene with an amine of the following general formula I:



wherein

R^1 and R^2 are each independently H, a C_1 - C_{18} -alkyl, C_2 - C_{18} -alkenyl, C_4 - C_{18} -cycloalkyl, C_1 - C_{18} -alkylaryl, hydroxy- C_1 - C_{18} -alkyl, poly(oxyalkyl), polyalkylene polyamine or a polyalkylene imine radical; or, together with the nitrogen atom to which they are bonded, are a heterocyclic ring.

Claim 13 (Currently Amended): The formulation according to claim 1, wherein the ~~PIBA~~ polyalkene amine is a polyisobutene amine ~~used~~ is the reaction product of ~~[[the]]~~ a hydroformylation and subsequent reductive amination of reactive polyisobutene ~~PIB~~.

Claim 14 (Currently Amended): The formulation according to claim 1, wherein the solvent is the process solvent of ~~[[the]]~~ hydroformylation and subsequent reductive amination of reactive polyisobutene ~~PIB~~.

Claim 15 (Currently Amended): A ~~PIB~~ polyisobutene formulation, comprising:
~~PIBA~~ polyisobutene amine in a mixture comprising
a solvent ~~as defined in claim 3~~,

wherein ~~PIBA~~ polyisobutene amine is present in a fraction of at least about 63% by weight, based on ~~[[the]]~~ a total weight of the mixture;

wherein the solvent has

a density at 15°C according to ASTM D 4052 and EN ISO 12185-1996 in the range from about 650 to 900 kg/m³, and/or

a viscosity at 20°C according to ASTM D 445 in the range from about 1.0 to 5.0 mm²/s;

wherein the solvent is selected from mixtures of:

S1) at least one n- or iso-C₁₀-C₁₄ paraffin,

S2) at least one C₁₀-C₁₄ naphthene; and

wherein S1 and S2 are present in a mixing ratio of from 10:90 to 90:10.

Claim 16 (Currently Amended): A fuel or lubricant composition, comprising:
[[,]] in a majority of a fuel or lubricant, an amount, effective as an additive, of a formulation according to claim 1.

Claim 17 (Currently Amended): An printing ink, comprising:

~~The use of a~~ as an additive the formulation according to claim 1

a) ~~as an additive for fuel or lubricant compositions, or~~

b) ~~as an additive for printing inks.~~

Claim 18 (Currently Amended): ~~The use according to claim 17 as an additive~~ A
method for improving the intake system-cleaning action of a gasoline fuel, comprising:
adding the formulation according to claim 1 to a gasoline fuel, to obtain a mixture;
and

contacting the mixture with said intake system.

Claim 19 (Currently Amended): An additive package, comprising:
a formulation according to claim 1, ~~if appropriate~~ optionally in combination with at least one further coadditive.

Claim 20 (Currently Amended): ~~The use of a solvent S1, S2 or of A method for improving the low temperature performance of polyisobutene amine,~~ comprising:
adding a mixture of solvents S1 and S2 as defined in claim 5 for improving the low temperature performance of to polyisobutene amine PIBA;

wherein

S1) is at least one n- or iso-C₁₀-C₁₄ paraffin,

S2) is at least one C₁₀-C₁₄ naphthene;

wherein S1 and S2 are present in a mixing ratio of from 10:90 to 90:10.

Claim 21 (Currently Amended): A process for preparing a polyalkene amine formulation according to claim 1, wherein

- a) dissolving a polyalkene as defined in claim 7 is dissolved in a solvent mixture,
to obtain a solution as defined in claim 3;
wherein said polyalkene is a polymerization product of identical or different,
straight-chain or branched C₂-C₆ olefin monomers;
wherein said solvent mixture comprises
S1) at least one n- or iso-C₁₀-C₁₄ paraffin,
S2) at least one C₁₀-C₁₄ naphthene; and

wherein S1 and S2 are present in a mixing ratio of from 10:90 to 90:10;

- b) hydroformylating the solution ~~is hydroformylated in a manner known per se~~ in the presence of CO and H₂, to obtain an oxo product; and
- c) aminating said ~~the resulting~~ oxo product ~~is aminated~~ under hydrogenating conditions in the presence of an amine of the ~~above~~ following formula I in ~~claim 12~~



wherein

R¹ and R² are each independently H, a C₁-C₁₈-alkyl, C₂-C₁₈-alkenyl, C₄-C₁₈-cycloalkyl, C₁-C₁₈-alkylaryl, hydroxy-C₁-C₁₈-alkyl, poly(oxyalkyl), polyalkylene polyamine or a polyalkylene imine radical; or, together with the nitrogen atom to which they are bonded, are a heterocyclic ring.

Claim 22 (Currently Amended): The process according to claim 21, wherein [[a]] the solution is preferred in stage a) whose ~~has~~ solvent fraction [[is]] of at most 40% by weight based on [[the]] a total weight of the solution.